

II. Rejection of Claims 1-2 and 5-6 Under 35 U.S.C. § 102

Claims 1-2 and 5-6 stand rejected as being anticipated by JP 6346014.

The Examiner contends that JP '014 discloses a water based ink composition for ball-point pens which comprises pigment, polar solvent comprising water and other solvent (such as ethylene glycol), pH controlling agent, and 0.01-10% thickener which swells in an alkaline medium resulting in an increase in viscosity of the ink. The Examiner asserts that the thickener contains both a hydrophobic group, such as styrene, and a carboxyl group, and that styrene is both a “cyclic hydrocarbon” and an “aromatic hydrocarbon.”

In response, claim 1 has been amended to remove “aromatic hydrocarbon” as a member of the Markush group, and to recite “non-aromatic cyclic hydrocarbon.” Dependent claim 6 has been amended accordingly.

The Examiner's attention is directed to the specification at page 9, lines 14-18. The hydrophobic group is defined to encompass “linear and cyclic hydrocarbon groups”, and “an aromatic hydrocarbon group”. It is clear from the text that the applicant intended the term “linear and cyclic hydrocarbon groups” to encompass non-aromatic hydrocarbons, since aromatic hydrocarbons are separately covered. Claims 1 and 6 have been amended to further emphasize this distinction. Since the term “non-aromatic cyclic hydrocarbon” does not encompass aromatic cyclic hydrocarbons such as styrene, the claimed composition differs from the styrene containing composition of JP '014.

In the Advisory Action dated August 30, 2001 (Paper No. 17), the Examiner stated “If applicant were to amend the claims in order to limit the thickener to those thickeners

which are outside the scope of the thickeners disclosed in JP 636014, it is the examiner's position that this would help materially advance the prosecution of the application". In view of the foregoing amendments, the applicant believes that this has been achieved. Accordingly, the anticipation rejection over JP '014 has been overcome, and it is respectfully requested that the rejection be withdrawn.

III. Rejections Under 35 U.S.C. §103

A Rejection of claims 1-2 and 5-6 over Okumura *et al.* either alone or in view of Doolan *et al.* and Shay *et al.*

Claims 1, 2, 5 and 6 stand rejected as obvious over Okumura (U.S. Patent No. 5,580,374) either alone or in view of Doolan *et al.* (U.S. Patent No. 5,425,806) and Shay (U.S. Patent No. 5,478,602).

The Examiner contends that Okumura *et al.* discloses an aqueous ink composition for ball point pens wherein the ink contains water, polar solvent, pigment, pH adjustor and 3% thickener comprising polymers containing carboxyl groups and hydrophobic groups such as styrene. The Examiner further contends that the difference between Okumura *et al.* and the claimed invention is the requirement in the claims (a) that the thickeners are not explicitly referred to as alkali-swelling associative thickeners and (b) amount of thickener.

The Examiner uses Doolan *et al.* and Shay *et al.*, to show that the thickeners disclosed in Okumura *et al.* may be considered alkali-swelling associative thickeners.

Therefore, the Examiner concludes that it would have been obvious to one of ordinary skill in the art that Okumura *et al.*'s disclosure of thickeners identical to those in the present claimed invention would function as alkali-swelling associative thickeners, or

alternatively, that thickeners as disclosed by Okumura *et al.* are indeed alkali-swelling associative thickeners given the disclosure of both Doolan *et al.* and Shay *et al.*

The Examiner contends that Okumura *et al.* discloses thickeners containing carboxyl groups and hydrophobic groups such as styrene.

In response, claim 1 has been amended to remove “aromatic hydrocarbon” as a member of the Markush group, and to recite “non-aromatic cyclic hydrocarbon”. Since the term “non-aromatic cyclic hydrocarbon” does not encompass aromatic cyclic hydrocarbons such as styrene, the claimed composition differs from compositions containing styrene-based thickeners, such as those taught by Okumura *et al.*

The claims of the present invention require “a thickener which is associative and swells in an alkaline medium”.

The Examiner is respectfully advised that typical polycarboxylic acid thickeners are alkali neutralization thickeners whose viscosity is typically reduced in alkali medium, i.e. polymers having a hydrophobic group and a carboxyl group are not always associative. The Examiner’s attention is directed to Examples 1, 3, and 4 of Okumura *et al.* As can be seen, each of these inks contain 3.0 wt % of the ammonium salt of styrene-acrylic acid resin. However, the viscosity of the ink in each example is only 3.5-3.6 mPa.s.

Indeed, none of the thickeners disclosed by Okumura *et al.* at col. 6, lines 9-28 are encompassed by the claims of the present application. For example, the alkali salts of copolymers containing acrylic acid and methacrylic acid (disclosed in Okumura *et al.* at col. 6, lines 25-26) and the alkali salts of copolymers of vinyl acetate and crotonic acid (disclosed in Okumura *et al.* at col. 6, lines 27-28) are polymers with a branched hydrocarbon hydrophobic group, not a linear hydrocarbon hydrophobic group as required by the claims.

Additionally, Okumura *et al.* only discloses alkali salts of these copolymers. There is no suggestion to use the non-salt forms of these copolymers.

Okumura *et al.* does not teach or suggest thickeners encompassed by the claims of the present application. Neither Doolan *et al.* not Shay *et al.* teach or suggest the thickeners of the present invention. Accordingly Okumura *et al.* alone, in combination with Doolan *et al.* and Shay *et al.*, does not teach or suggest the composition of the present invention.

In view of the amendments and arguments made, it is believed that the above-referenced rejection under 35 U.S.C. §103 has been obviated, and it is respectfully requested that the rejection be withdrawn.

B Rejection of claims 3 and 4 over Okumura *et al.* either alone or in view of Doolan *et al.* and Shay *et al.* and further in view of Kobayashi *et al.* or JP 54138732

Claims 3 and 4 are rejected as obvious over Okumura *et al.* either alone or in view of Doolan *et al.* and Shay *et al.* as applied to claims 1, 2, 5 and 6 above, and further in view of Kobayashi *et al.* (U.S. Patent No. 4,822,417) or JP 54138732. The Examiner states that the difference between Okumura *et al.* either alone or in view of Doolan *et al.* and Shay *et al.* is the requirement in the claims of a pigment surface treated with a resin and/or surfactant.

The Examiner states that both Kobayashi *et al.* and JP 5418732 disclose the use of pigments surface treated with resin, and concludes that it would have been obvious to one of ordinary skill to use this type of surface treated pigment in the ink of Okumura *et al.*

As stated in III(A) above, claim 1 has been amended to remove “aromatic hydrocarbon” from the Markush group, and to recite “non-aromatic cyclic hydrocarbon”. Since the term “non-aromatic cyclic hydrocarbon” does not encompass aromatic cyclic hydrocarbons

such as styrene, the claimed composition differs from compositions containing the styrene-based thickeners such as those described in Okumura *et al.*

Further, as stated in III(A) none of the thickeners disclosed by Okumura *et al.* at col. 6, lines 9-28 are encompassed by the claims of the present application, which require an associative thickener having a carboxyl group and a hydrophobic group selected from the group consisting of a linear hydrocarbon, a non-aromatic cyclic hydrocarbon, an halogenated alkyl, an organosilicon group and a fluorinated carbon group.

Since Okumura *et al.* does not teach or suggest thickeners encompassed by the claims of the present application, Okumura *et al.* in combination with the other cited references does not teach or suggest the composition of the present invention.

In view of the amendments and arguments made, it is believed that the above-referenced rejection under 35 U.S.C. § 103 has been obviated, and it is respectfully requested that the rejection be withdrawn.

C Rejection of claims 3 and 4 over JP 6346014 in view of Kobayashi *et al.* or JP 5418732

Claims 3 and 4 have been rejected as obvious over JP 6346014 in view of either Kobayashi *et al.* or JP 54138732. The Examiner contends that JP '014 discloses styrene/acrylic thickeners, and that the only difference between JP '014 and the present invention is the requirement in the present claims of a pigment surface treated with a resin and/or surfactant.

The Examiner contends that both Kobayashi *et al.* and JP '732 disclose the use of pigments surface treated with resin, and concludes that it would have been obvious to one of ordinary skill to use this type of surface treated pigment in the ink of JP '014.

In response, claim 1 has been amended to remove “aromatic hydrocarbon” as a member of the Markush group, and to recite “non-aromatic cyclic hydrocarbon”. Since the term “non-aromatic cyclic hydrocarbon” does not encompass aromatic cyclic hydrocarbons such as styrene, the claimed composition differs from the styrene containing composition of JP ‘014.

JP ‘014 discloses, at paragraph 8, oil in water emulsion thickeners of the carboxylated acrylic type, the styrene/acrylic type, or the butadiene type. None of these thickeners disclosed by JP ‘014 are encompassed by the claims of the present application.

JP ‘014 does not teach or suggest thickeners encompassed by the claims of the present application. Accordingly, JP ‘014, in combination with the other cited references, does not teach or suggest the composition of the present invention.

In view of the amendments and arguments made, it is believed that the above-referenced rejection under 35 U.S.C. § 103 has been obviated, and it is respectfully requested that the rejection be withdrawn.

D Rejection of claims 7-9 over JP 6346014 in view of Shay *et al.*

Claims 7-9 stand rejected as obvious over JP ‘014 in view of Shay *et al.* The Examiner contends that JP ‘014 discloses a water based ink composition for ball-point pens which comprises pigment, polar solvent comprising water and other solvent (such as ethylene glycol), pH controlling agent, and 0.01-10% thickener which swells in an alkaline medium resulting in an increase in viscosity of the ink.

The Examiner states that the difference between JP ‘014 and claims 7-9 is the requirement in the claims of a specific type of thickener; acknowledging that JP 6346014 does

not disclose thickeners comprising halogenated alkyl, organosilicon or fluorinated carbon groups.

The Examiner asserts that Shay *et al.* discloses thickeners wherein the hydrophobic group includes halogenated alkyl, organosilicon and fluorinated carbon groups, and further discloses the suitability of such thickeners for any aqueous composition including inks. The Examiner contends that Shay *et al.* discloses high efficiency, better resistance to hydrolysis and better rheology as motivating factors to use such thickeners, concluding that in light of such motivation, it would have been obvious to one of ordinary skill in the art to use such thickeners in the ink of JP '014 in order to produce an ink which has the desired rheology, and thus arrive at the claimed invention.

Applicants respectfully traverse this rejection, on the grounds that none of the thickeners disclosed by JP '014 are encompassed by claims 7-9 of the present application.

Further, Shay *et al.* merely states in passing that the thickeners may be used in aqueous ink compositions. Indeed, this is just one in a long list of potential possible applications disclosed by Shay *et al.*, including such diverse and varied applications as textiles, drilling muds, caulks, adhesives, paper coatings, furniture finishes, latex paints, foundry core washes, and the like. There is no teaching in Shay *et al.* as to how such thickeners could successfully be incorporated specifically into ink compositions.

One of ordinary skill in the art would therefore not be motivated to combine the thickeners of Shay *et al.* with the inks disclosed in JP '014. Accordingly, JP '014 in combination with Shay, does not teach or suggest the composition of the present invention.

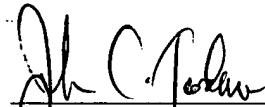
In view of the arguments made above, it is believed that the above-referenced rejection under 35 U.S.C. § 103 has been obviated, and it is respectfully requested that the rejection be withdrawn.

IV. Conclusion

In view of the foregoing, it is believed that claims 1-9 are neither anticipated by not obvious over the prior art of record. Claims 1-9 are believed to be in condition for allowance.

Favorable action is earnestly solicited.

Respectfully submitted,



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June 3, 2002

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Masaru MIYAMOTO et al.

Serial No.: 09/297,399

Group Art Unit: 1714

Filed: April 29, 1999

Examiner: C. E. SHOSHO

For: WATER BASED INK COMPOSITION FOR BALLPOINT PEN

Assistant Commissioner for
Patents
Washington, DC 20231

June 3, 2002

MARK-UP FOR AMENDMENT UNDER 37 C.F.R. § 1.111 OF JUNE 3, 2002

IN THE CLAIMS:

1. (Four Times Amended) A water based ink composition for a ballpoint pen which comprises a thickener which is associative and swells in an alkaline medium, said thickener comprising a polymer having a carboxyl group and a hydrophobic group selected from the group consisting of a linear hydrocarbon, a non-aromatic cyclic hydrocarbon, [an aromatic

hydrocarbon,] an halogenated alkyl, an organosilicon group, and a fluorinated carbon group, a pigment, a polar solvent comprising water and other water-miscible solvents and a pH controlling agent.

6. (Amended) The water based ink composition for a ballpoint pen of claim 1 wherein the hydrophobic group is a non-aromatic cyclic hydrocarbon.